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Study of the phosphoproteome of the pathogenic yeast *Cryptococcus neoformans* var *grubii*

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Cryptococcus neoformans is encapsulated pathogenic yeast, which causes life threatening meningitis in immunocompromised individuals. Cryptococcal infections occur throughout the world and most often it is a reflection of the AIDS pandemic. *C. neoformans* var. *grubii* is the most prevalent and virulent form among the two varieties of *C. neoformans*, the other one being *C. neoformans* var. *neoformans*. cAMP dependent PKA-induced phosphorylation events have been implicated in the expression of these virulence traits, which highlights the importance of phosphoproteins in virulence and infection. The study involved the global profiling of phosphoproteome of *C. neoformans* to enable a better understanding of molecular regulation of its virulence and pathogenesis. High resolution mass spectrometry of TiO₂ enriched phosphopeptides from *C. neoformans* var. *grubii* grown in culture led to the identification of 1089 phosphopeptides derived from 648 proteins (10% of the total proteome) including about 45 kinases. Single pot enrichment strategy and the enrichment that followed bRPLC technique were used to identify these proteins. The study observed that the relative occurrence of phosphorylation on these residues was similar to that of yeast and human. Motif enrichment analysis revealed that most CDK family substrates were found to be phosphorylated. This indicates that cyclin-dependent kinases were among the active kinases in the pathogen in culture. These studies provide a framework for understanding virulence mechanisms in the context of signaling pathways in pathogenic yeast. Also, it can lead to newer paths of discovery and development of anti-cryptococcal drugs that target these proteins.

Biography

Raju Ravikumar has completed his Doctor of Medicine from Bangalore University and further got Certificate Course in Immunology from University of London. He is the Professor and Head of Neuromicrobiology at National Institute of Mental Health and Neurosciences Bangalore, India. He has published more than 40 scientific papers in national and international journals and is serving as life member in many Microbiology associations. He has conducted many workshops, CME's and one chapter conference in Microbiology. He is in several administrative committees of the Institute. He is one of the senior microbiologists of India.

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